FRACTURE OF THE ASTRAGALUS WITH SUB-ASTRAGALOID FORWARD DISLOCATION OF THE FOOT. REMOVAL OF THE ENTIRE ASTRAGALUS.

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Mr. F., a Finlander, thirty-seven years old, from Ishpeming, Mich., a miner by occupation, seen in consultation with Dr. B., in Ishpeming, gave the following history:

Four months ago, while working in a mine, he fell backwards from a height, a number of rocks falling with him. He landed on his feet and after being extricated from the rocks it was found that his left ankle was swollen considerably and the foot dislocated forwards. An immediate attempt was made to reduce the dislocation under narcosis, but it proved unsuccessful, and as an insurance company paid for him while unable to work, he would not permit a bloody reduction immediately.

When I saw him four months later the following status presented itself: The anklo joint of his left leg was partially ankylosed. The left foot, on which he was unable to step, was standing in a decided varus position and seemed largely elongated. Taking measurement from the external malleolus to the os calcis, the distance was approximately 1 to 1½ cm. on the injured foot, while on the healthy foot the same distance was 3 cm. The distance measured from the inner malleolus to the tip of the great toe was greater on the injured than on the healthy foot. I advised taking a Röntgen-ray picture from three directions, to clear up the diagnosis, and found the conditions as demonstrated in the accompaning plates.

Number 1 was taken in an antero-posterior direction and showed the fracture of the external malleolus. Nos. 2 and 3 were taken from the inner and outer side respectively and demonstrated that we had to deal with a fracture of the astragalus and subastragaloid forward dislocation of the foot. As four months had elapsed since the date of the accident, I did not take the bloody reduction into consideration, but advised the removal of either a part or the entire astragalus, to overcome the deformity and to make the foot useful.

I used an incision extending from 6 cm. above the external malleolus down parallel to its posterior border to the tip of the external malleolus, from there in a curved direction to the middle of the foot on its dorsal side. As both peronei tendons were crossing the field of the incision and could not be retracted sufficiently to clear the field of operation, these were divided. Then the entire astragalus was removed with great difficulty, owing to the dense adhesions that had formed; the peronei tendons sutured and the wound partially closed and partially drained. A plaster-of-Paris cast was then applied with the foot standing in an overcorrected position.

Ten weeks after the operation he was able to walk about and four months later, when he did not receive any more money from the insurance company, the slight pain of which he still complained disappeared and he took up his difficult work as a miner again. A movable joint has formed between the external and internal malleolus and the os calcis.

The position in which the foot is standing now, is shown on Plate No. 4.

Epicrisis.—Subastragaloid dislocation of the foot is of rare occurrence and was first described by Nélaton in his "Surgical Pathology." The condition has been frequently mistaken for dislocation of the astragalus, and Broca was the first (1853) to show that subastragaloid dislocation must be strictly differentiated from dislocation of the astragalus. Deetz (Deutsche Zeitschr. f. Chirurgie, Vol. 74, p. 581) has recently collected all cases of subastragaloid dislocation of the foot, cited in the world's literature. To avoid unnecessary repetition I refer the reader to this article in regard to literature on this subject. Deetz found that subastragaloid dislocation to the inner side is most common; twenty-eight cases being reported. Twenty-five cases of subastragaloid dislocation to the outer side are reported in the literature; twelve cases of backward dislocation and only six cases of forward

Fig. 1.—Fracture of Astragalus and Subastragaloid. Forward dislocation of the foot. View from outer side. Op. 2, 3, 1904.

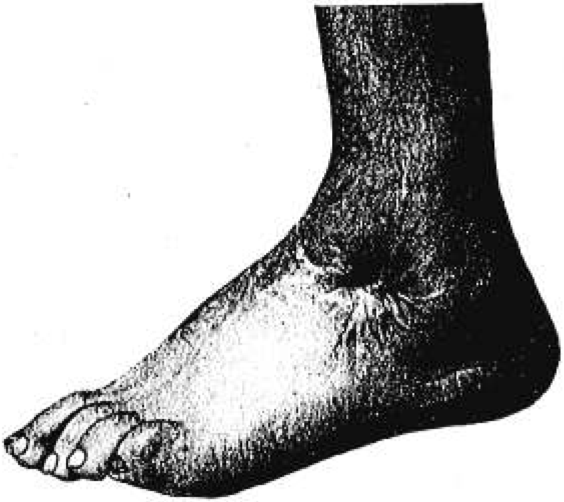

Fig. 2.—Fracture of Astragalus and Subastragaloid. Forward dislocation of foot. Results after removal of Astragalus.

dislocation of the foot, to which he adds a case of his own. From these last seven cases, three,—*i. e.*, those reported by Parise, Petit and Planteau, were simple cases of subastragaloid dislocation without fracture of the astragalus, while the four others reported by Guenzerich, Sick, Mailland and Deetz, were complicated by a fracture of the astragalus. My case therefore would be the fifth case of subastragaloid forward dislocation of the foot with fracture of the astragalus, and is furthermore complicated by a fracture of the external malleolus.

That fractures of one or both malleoli are not so seldom complicated by partial or total fractures of the astragalus, has been proven since the enlightening of the dark field of fractures by the Röntgen ray.

In but one case of the seven cases of subastragaloid forward dislocation of the foot it was necessary, as in my case, to resect the entire astragalus because of the long standing of the deformity. This case (operated on by Kuester) is cited by Guenzerich, already mentioned above. The deformity existed, in this case, six months before the patient entered the hospital.

In regard to the cause of subastragaloid forward dislocation of the foot, the patient in nearly all cases gives the following similar anamnesis:

The patient seeing that he is falling from an exposed height such as a ladder or rock, jumps to save himself, backwards, or sideways and backwards, then lands with his heels on the ground, tumbling over backwards or forwards, with the foot standing in dorsal flexion. In my case it was difficult to get any definite history, since the patient spoke the Finnish language only.

Diagnosis.—The diagnosis is at times very difficult, due to the enormous swelling and intense pain in the ankle joint and surrounding parts. However, the lengthened dorsal aspect of the foot, so characteristic in all cases of subastragaloid forward dislocation, should always suggest the diagnosis, particularly if, as should be done, comparative measurements are made on the sound foot.

As the corpus of the astragalus is still in contact with the external and internal malleolus, some mobility in the ankle joint must naturally be present, providing the malleoli are not injured or fragments interposed at the same time.

In our days, with the Röntgen ray at our disposal, it is not only desirable but absolutely necessary for a scientifiic diagnosis and treatment to have a Röntgenogram of the fracture taken from several directions.

However as not every practitioner has easy access to a Röntgen-ray coil, the clinical symptoms of fractures ought by no means to be neglected in our teachings.

Treatment.—In recent cases of subastragaloid forward dislocation of the foot, reduction of the dislocation must be tried at once under anæsthesia, and can usually be accomplished by strong dorsal flexion of the foot. If this does not bring about the reduction on account of the interposition of fragments or muscular tissue or parts of the capsule, the bloody reduction without or with the removal of the interposing fragments will usually be followed by excellent results.

In cases of long standing, such as my case and the one cited by Guenzerich, nothing less than the entire removal of the astragalus is sufficient to overcome the mal-position of the foot, and, as the ultimate result in both cases has proven, may give excellent functional results, a new joint forming between the two malleoli and the os calcis.